

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Jari SIRVIÖ et al

Conf. No: 9131

Application No: 10/500,056

Art Unit: 3617

Filed: June 23, 2004

Examiner:

Jesus D. Sotelo

For: ARRANGEMENT FOR STEERING A WATER-
CRAFT

TRANSMITTAL OF BRIEF ON BEHALF OF APPELLANT

COMMISSIONER FOR PATENTS
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Sir:

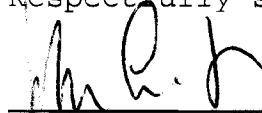
Notice of Appeal was filed in this case on July 13, 2007.
Submitted herewith is Appellant's Brief.

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1.16(h), (i) or (j).

Respectfully submitted,



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REAL PARTY IN INTEREST

The real party in interest is Aker Finnyards Oy.

RELATED APPEALS AND INTERFERENCES

None.

STATUS OF CLAIMS

Rejected: claims 8-13 and 15-17.

Allowed: none.

Withdrawn: none.

Objected to: none.

Canceled: claims 1-7, 14 and 18.

Claims 8-13 and 15-17 are appealed.

STATUS OF AMENDMENTS

An amendment canceling claim 18 has been submitted subsequent to the final rejection. The communication mailed August 15, 2007 indicates that the amendment will be entered.

SUMMARY OF CLAIMED SUBJECT MATTER

There are three modes of operation of a water craft or vessel that are particularly relevant to this application. Much of the time, the vessel may be navigating a straight course from a beginning point to an end point at cruising speed. From time to time, while navigating at cruising speed, it may be necessary to adjust the course of the craft to take account of, for example, change in direction of sea lanes. In harbor maneuvering, the vessel generally moves at low speed but must make relatively severe changes of course and speed. The claimed subject matter is concerned with supporting these three modes of operation (navigating on a straight course, course adjustment when cruising, harbor maneuvering).

The subject matter of claims 8-13 and claim 15 is a vessel having an aft region (shown in FIGS. 1A and 1B) and comprising a hull. The hull is illustrated in the drawings but has not been assigned a reference numeral. The vessel also comprises a cargo deck (which can be seen in FIG. 1A) at least in the aft region of the vessel and above which the hull defines a cargo space 10 for accommodating trucks 9 and other wheeled cargo. No reference numeral is assigned to the cargo deck.

In accordance with claim 8, a main propulsion means is located in the aft region of the vessel for propelling the vessel in a forward direction. As shown in FIGS. 1A and 1B, the main propulsion means may comprise diesel engines 4 coupled to a shaft-driven propeller 3 or, as shown in FIG. 2B, multiple shaft-driven propellers 3a, 3b may be provided or (FIGS. 3A and 3B) the main propulsion means may employ one or more water jet devices

(page 5, lines 20-25). It will be understood by those skilled in the art that a water jet device may be implemented by employing the diesel engines to drive one or more pumps that draw ambient water in at low speed and expel the water at high speed through one or more nozzles.

It will be understood by those skilled in the art that a conventional mechanism for steering a vessel includes a rudder that can be inclined relative to the center line of the craft. If the vessel is being propelled in the forward direction, forces transmitted from the inclined rudder to the hull of the vessel tend to influence the direction of movement of the vessel through the water. Since a rudder operates when the vessel is moving relative to the water, it may be said that the rudder is functionally connected to the means for propelling the vessel.

At least first and second steering propulsion devices 2 are installed below the cargo deck and located in the aft region of the vessel to first and second opposite sides respectively of the main propulsion means, as shown in FIGS. 1A, 1B, 2A, 2B, 3A and 3B. Each steering propulsion device 2 is selectively variable with respect to its propulsion direction (FIGS. 1B, 2A, 2B, 3A, 3B, page 5, lines 11-18). In this manner, steering of the vessel is continuously provided by the steering propulsion devices 2 without separate rudder means functionally connected to the main propulsion means.

The output required by the steering propulsion devices is in all less than 50% of the common (total) shaft output of the main propulsion means and the steering propulsion devices.

The main propulsion means and steering propulsion devices specified in claim 8 are advantageous in implementing the three modes of operation described above. For navigating on a straight course, the main propulsion means and the steering propulsion devices are both used, with the steering propulsion devices contributing up to one-third of the power needed for propulsion

of the vessel. In this mode of operation, the steering propulsion devices are positioned to propel the vessel in the forward direction. For course adjustment when cruising, the steering propulsion devices are turned to provide the desired steering effect while the main propulsion means continues to propel the vessel. For harbor maneuvering, the main propulsion means is not used for supplying propulsion power, propulsion power being provided exclusively by the steering propulsion devices. Since the vessel moves at low speed in harbor maneuvering, the steering propulsion devices have adequate power and provide effective steering. Because the steering propulsion devices provide in all less than 50% of the common shaft output of the main propulsion means and the steering propulsion devices, the steering propulsion devices can be much smaller than those in a similar vessel but in which the steering propulsion devices are the only source of propulsion power. The permitted small size of the steering propulsion devices in turn renders the claimed subject matter particularly applicable to a RoRo or RoPax vessel, in which vehicles are driven on and off the vessel through doors in the stern of the vessel, because it is then possible to avoid obstruction of the cargo space at the aft end of the vessel without locating the cargo deck at a greater height in the hull than would otherwise be desirable.

Claim 15 is dependent on claim 8 and is directed to the feature shown in FIG. 1A of the drawings, illustrating a maintenance space 8 defined below the cargo deck and in which the steering propulsion devices are accessible for maintenance purposes. See page 4, lines 9-11 and page 5, lines 2-6. By providing the maintenance space below the cargo deck, maintenance activities, which might otherwise encroach on the cargo deck, can be carried out concurrently with loading and unloading of the vessel.

Claim 16 is directed to a method of operating a water craft

or vessel having an aft region and first and second opposites sides and comprising a hull, a cargo deck and a main propulsion means located in the aft region of the vessel for propelling the vessel in a forward direction.

The method claim 16 is similar to claim 8 in several respects but does not recite first and second steering propulsion devices. Instead, claim 16 recites the steps of applying steering propulsion forces to the vessel at first and second locations in the aft region to the first and second sides respectively of the main propulsion means and selectively varying the directions of the steering propulsion forces applied to the vessel at the first and second locations. These steps effect steering of the vessel. Also, instead of specifying the relative power requirements of the steering propulsion devices and the main propulsion means, claim 16 recites an operating step that relates to the practical reason for the limitation in claim 8 regarding power requirements. Thus, in accordance with the method defined in claim 16, the main propulsion means is used exclusively to propel the vessel and not to apply steering force to the vessel. The method of claim 16 therefore excludes the possibility of using the main propulsion means to propel the vessel and employing the forward motion of the vessel to create, through a rudder, a steering force. The method further requires steering the vessel by applying steering propulsion forces to the craft at first and second locations in the aft region to opposite sides respectively of the main propulsion means and by selectively varying the directions of the steering propulsion forces applied to the vessel at the first and second locations.

Claim 17 is dependent on claim 16 and adds the limitation of applying steering propulsion forces to the vessel using steering propulsion devices located in the aft region of the vessel to the opposite respective sides of the main propulsion means and also using the steering propulsion devices to propel the vessel in a

forward direction. Thus, the method recited in claim 17 is concerned with using the steering propulsion devices not only for steering the vessel (as the only source of steering propulsion forces) but also to supplement the propulsion forces provided by the main propulsion means for propelling the craft in the forward direction.

Section 112, sixth paragraph

The "main propulsion means" recited in claim 8 is a means plus function element as permitted by 35 USC 112, sixth paragraph. The function attributed to the main propulsion means is propelling the craft in a forward direction. The structure, material or acts described in the specification as corresponding to this function is, in the case of the embodiment shown in FIGS. 1A and 1B, the engines 4, shaft 5 and propulsion device 3. The function of the engines 4, shaft 5 and propulsion device 3 in propelling the craft in a forward direction is evident from the illustration and description of these components. Thus, the sentence starting at page 4, line 31, states that the diesel engines 4 serve as prime mover for the main propulsion device (propeller) 3 and that the output of the diesel engines is transferred to the main propulsion device 3 by means of the shaft 5. In the case of the alternative solution illustrated in FIG. 2B, there are two shafts 5 and two main propulsion devices 3a and 3b. See page 5, lines 17-18. In the case of the alternative solutions described with reference to FIGS. 3A and 3B, water jet devices 11 are employed as the main propulsion device(s). The manner in which the structure described and illustrated in connection with the alternative solutions shown in FIGS. 2B, 3A and 3B operates is self-evident from the drawings.

No means plus function element is recited in claim 15.

The "main propulsion means" recited in claim 16 is not an operative step of the method but is part of the structure on

which the operative steps act. The "main propulsion means" recited in claim 16 is a means plus function element as permitted by 35 USC 112, sixth paragraph.

The function attributed to the main propulsion means is propelling the craft in a forward direction. The structure, material or acts described in the specification as corresponding to this function is, in the case of the embodiment shown in FIGS. 1A and 1B, the engines 4, shaft 5 and propulsion device 3. The function of the engines 4, shaft 5 and propulsion device 3 in propelling the craft in a forward direction is evident from the illustration and description of these components. Thus, the sentence starting at page 4, line 31, states that the diesel engines 4 serve as prime mover for the main propulsion device (propeller) 3 and that the output of the diesel engines is transferred to the main propulsion device 3 by means of the shaft 5. In the case of the alternative solution illustrated in FIG. 2B, there are two shafts 5 and two main propulsion devices 3a and 3b. See page 5, lines 17-18. In the case of the alternative solutions described with reference to FIGS. 3A and 3B, water jet devices 11 are employed as the main propulsion device(s). The manner in which the structure described and illustrated in connection with the alternative solutions shown in FIGS. 2B, 3A and 3B operates is self-evident from the drawings.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

1. Rejection of claims 8-13, and 15-17 under 35 USC 103 over Tigges et al in view of Oshima.

Tigges et al discloses a vessel having an aft region and first and second opposite sides. The vessel has a hull and a cargo deck defining a cargo space for accommodating trucks and other wheeled cargo. The figure description on pages 7 and 8 of Tigges et al indicates that FIGS. 1-5 show a first vessel and that FIGS. 6-8 show features of at least one other vessel. FIG.

9 appears to be applicable to each of the vessels.

The first vessel, shown in FIGS. 1-5, has a hull with two skeggs 19 (FIG. 5; page 9, line 32) to left and right respectively of the center line of the vessel and two rudder propellers 6 aft of the skeggs respectively (page 8, lines 30-33) and each having dual propellers (FIG. 1; page 8, lines 26-27). The two rudder propellers 6 are positioned to opposite respective sides of the center line of the vessel. FIGS. 6 and 7 do not illustrate the skeggs or rudder propellers. FIG. 8 illustrates the forward parts 30 of the skeggs and is thus consistent with FIG. 5 in suggesting that two skeggs are provided, to the left and right respectively of the center line of the vessel. FIG. 9 appears to show frame forms of the vessel on the right side and is consistent with the vessel having two skeggs to left and right respectively of the center line of the vessel.

Tigges et al is a publication of a Canadian patent application. Although the Canadian patent application is written to support claims to a vessel with only one rudder propeller, it is nevertheless clear that Tigges et al does not actually disclose a vessel having only one rudder propeller (positioned centrally of the vessel).

Oshima discloses that if it is desired that a ship should generate underwater noise at a reduced level, for example because the ship uses underwater acoustic equipment, it is advantageous for the ship to employ turning propellers 3 (FIGS. 1 and 2) (i.e. rudder propellers) for steering while a main propeller 1 is used for propulsion of the ship.

In support of the rejection, the examiner states that the hull of Tigges et al includes a main propulsion means located in the aft region of the vessel for propelling the vessel in a forward direction (final rejection, page 2) and that Oshima discloses a ship with a main fixed propeller (i.e. not a steering propeller) and two rotatable steering propulsion units located in

the aft region of the vessel to the first and second sides of the main propeller 1 (final rejection, page 2). The examiner asserts that in view of these disclosures in Oshima, it would have been obvious to substitute a main propulsion means located in the aft region of the vessel and first and second propulsion devices located in the aft region of the vessel to the first and second sides of the main propulsion means for the propulsion/steering means of Tigges et al.

It appears that there are two principal lines of reasoning that could be used to justify modification of the vessel of Tigges et al in view of Oshima in order to arrive at the subject matter of claim 8. The first line of reasoning is that it would have been obvious to employ the steering and propulsion arrangement of Oshima (employing a main shaft driven propeller and two rudder propellers) in lieu of the steering and propulsion arrangement of Tigges et al. The second line of reasoning is that since both Tigges et al and Oshima show a vessel equipped with two rudder propellers, it would have been obvious in view of Oshima (which shows a shaft driven propeller between the two rudder propellers) to have equipped the ship of Tigges et al with a shaft driven propeller between the two rudder propellers. For reasons discussed below, it appears that the examiner considers that the first line of reasoning is the appropriate one.

With respect to the limitation in claim 8 regarding the output required by the steering propulsion devices being less than 50% of the shaft output of the main propulsion means and the steering propulsion devices, the examiner asserts that since the steering propellers shown in FIG. 1 of Oshima are smaller than the shaft-driven propeller 1, it is reasonable to expect the shaft output of the steering units to be less than that of the main propulsion unit and that the amount of difference would have been an obvious matter of design choice to one having ordinary skill in the art.

With respect to claim 15, the examiner asserts that provision of a maintenance space below the cargo space for maintaining the steering propulsion devices would have been an obvious matter of design choice to a person of ordinary skill in the art.

The examiner asserts that the method steps of claim 16 "are encompassed in the above combination" (final rejection, page 4).

ARGUMENT

A. Oshima and Tigges et al are not properly combinable in the manner suggested by the examiner to support a rejection of claims 8-13 and 15-17 under 35 USC 103(a).

Resolution of the issue raised by this appeal requires determining whether it would have been obvious to a person of ordinary skill in the art to apply teaching of Oshima to the ship disclosed by Tigges et al and, if so, whether the result would be a vessel, or a method of operating a vessel, in accordance with the claims under appeal.

In *KSR International Co. v. Teleflex, Inc.*, 550 U.S. ____ (2007), the Court explained that a person of ordinary skill in the art attempting to solve a problem will not be led only to those prior art references that disclose solutions of the same problem. (slip op. page 16) Nevertheless, in order to sustain a rejection on obviousness grounds, "there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR International Co. v. Teleflex, Inc.*, (slip op. page 14) quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). The Court agreed that "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." (slip op. page 14) and stated that "it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the

elements [of the patent] in the way the claimed new invention does." (slip op. page 15)

Although the Court stressed that the proper analysis of obviousness under 35 USC 103 is not rigid but expansive and flexible (slip op. page 11), the Court nevertheless emphasized that the analysis is objective (slip op. page 2) and made clear that the obviousness inquiry under 35 USC 103 centers on problems and solutions. "[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." (slip op. page 16) "The proper question to have asked was whether a pedal designer of ordinary skill, facing the wide range of needs created by developments in the field of endeavor, would have seen a benefit to upgrading Asano with a sensor." (slip op. page 20)

Applying the Court's analysis in *KSR International Co. v. Teleflex, Inc.* to the case of a pending application, the first question to ask is what problem known in the field of endeavor, i.e., ship propulsion and steering, and addressed by the application under appeal, provides a reason for combining the disclosures of Oshima and Tigges et al to arrive at the subject matter of claim 8, i.e. what is the motivation for the combination? or, what is the "articulated reasoning with some rational underpinning" in support of the rejection? Regardless of the line of reasoning employed to justify combining the disclosures of the references to arrive at the claimed subject matter, appellant believes that in order to justify a rejection of claim 8 under 35 USC 103 over Tigges et al in view of Oshima, the examiner must identify a reason why a person of ordinary skill in the art would take the main propulsion device of Oshima and apply it to the vessel of Tigges et al. Appellant suggests that such a reason might be found in a perceived problem with the vessel disclosed by Tigges et al or a perceived advantage of

using the arrangement disclosed by Oshima in the vessel disclosed by Tigges et al.

With respect to motivation to apply the teaching of Oshima to the vessel of Tigges et al, the examiner states in paragraph 6 on page 4 of the final rejection "The motivation, however, is very clear. The use of auxiliary steering propellers in combination with a main propulsion unit would have been desirable to provide more positive steering of the watercraft." In Tigges et al, the rudder propellers are the only source of both propulsion force and steering force and so the entire resource used to propel the vessel may be brought to bear in order to steer the vessel. The examiner has argued that since Oshima shows the rudder propellers to be substantially smaller than the main propeller, the shaft output of the rudder propellers is less than that of the main propeller. Therefore it can be inferred that some of the resource available for propelling the vessel of Oshima is not available for steering. Application of the propulsion and steering arrangement of Oshima to the ship of Tigges et al would not provide more positive steering but would in fact reduce the steering performance of the vessel.

Tigges et al discloses that a cargo ship may be propelled exclusively by rudder propellers located to opposite respective sides of the center line of the ship, and without a main propulsion means between the rudder propellers. The hull of Tigges et al is described as being optimized for a rudder propeller by providing skeggs 8 aligned with the rudder propellers respectively. The examiner has not drawn attention to any problem that might affect the ship of Tigges et al and would be alleviated by employing a main propulsion means disposed between the two rudder propellers, based on the disclosure of Oshima.

In view of the foregoing, appellant submits that the examiner has not identified a plausible "reason that would have

prompted a person of ordinary skill in the relevant field to combine the elements [of the claim] in the way the claimed new invention does." *KSR International Co. v. Teleflex, Inc.*, 550 U.S. ____ (2007) (slip op. page 15).

Since Tigges et al discloses a vessel equipped with two rudder propellers, not "a main propulsion unit," it appears that the examiner has adopted the first line of reasoning discussed above.

Further, it would not have been obvious in view of Oshima to have provided the ship of Tigges et al with a main shaft-driven propeller without a separate rudder means, in accordance with the second line of reasoning discussed above. Since a main propulsion means without a separate rudder means functionally connected thereto would not improve steering of the vessel disclosed by Tigges et al, the motivation invoked by the examiner does not support modifying the vessel of Tigges et al based on the disclosure of Oshima.

In view of the foregoing, appellant submits that the examiner has not identified a plausible motivation for modifying the ship disclosed by Tigges et al by using a main propulsion means intermediate two rudder propellers, regardless of the line of reasoning used to justify the modification. The examiner's argument in support of the rejection therefore reduces to the assertion that because it would be technically feasible to apply the disclosure of Oshima to the ship of Tigges et al, it would have been obvious to do so. The Court in *KSR International Co. v. Teleflex, Inc.*, 550 U.S. ____, did not suggest that this would be an adequate basis for a rejection under 35 USC 103 and in fact appears to have signalled that this argument would not be adequate.

B. Oshima does not provide any motivation for modifying the vessel of Tigges et al.

Oshima does not contain a general teaching that a vessel should be provided with a main propulsion means located in the aft region of the vessel for propelling the vessel in a forward direction and first and second steering propulsion devices located in the aft region of the vessel to the first and second sides of the main propulsion means. On the contrary, Oshima is concerned with a very specific problem, namely excessive underwater noise in a vessel having a need for a quiet underwater environment, and the teaching of Oshima is directed to this problem. The record does not establish that the problem to be solved by the structure disclosed by Oshima, namely reducing underwater noise in an oceanic research ship that uses underwater acoustic equipment, arises in the RoRo or RoPax ship disclosed by Tigges et al.

C. The declarations of Karl Hamberg should not be dismissed as if they were mere argument.

The declarations of Karl Hamberg qualify him as an expert regarding the topic on which he opines. Therefore, Mr. Hamberg's declarations are admissible as fact evidence that must be weighed and cannot properly be excluded as mere opinion. Mr. Hamberg states in paragraph 9 of his declaration dated January 24, 2007 that by utilizing a main propulsion device and two smaller steering propulsion devices having a combined power output less than 50% of the total output of the propulsion arrangement, a ship has efficient propulsion means (for forward propulsion) because the main propulsion device provides most of the power needed for propulsion of the vessel, and has good maneuverability due to the steering propulsion devices, which are smaller and lighter than if they were the sole propulsion means, as in Tigges et al. Mr. Hamberg concludes that the arrangement described and claimed in this application would be less expensive than a traditional one as shown by Tigges et al yet still allows for

more cargo and more efficient movement during harbor operation. Appellant submits that these facts show that the subject matter of claim 8 offers clear advantages over the prior art and that the prior art contains no hint of these possible advantages or of how they might be accomplished.

D. The prior art does not disclose or suggest the power relationship set forth in claim 8.

Claim 8 contains a specific limitation regarding the power of the steering propulsion devices relative to the main propulsion means.

Neither Tigges et al nor Oshima discloses the power relationship set forth in claim 8. As discussed above, the examiner has dismissed this relationship as a matter of obvious design choice, if not disclosed by Oshima. However, the drawings in Oshima are obviously highly schematic and should not be relied on as conveying information regarding relative sizes. Also, Oshima does not explicitly disclose any information regarding relative power output. Moreover, even if Oshima implies that the power of the rudder propellers is less than that of the main propeller, the record does not contain any articulated reasoning why that relationship, in a ship for oceanic research or cable laying, would be applicable to the RoRo or RoPax vessel of Tigges et al.

E. Claim 15 is patentable independently of claim 8.

Claim 15 is dependent on claim 8 and recites that a maintenance space is defined below the cargo deck and the steering propulsion devices are accessible in the maintenance space for maintenance purposes. The examiner has dismissed the feature of claim 15 as an obvious matter of design choice to one having ordinary skill in the art.

The sentence starting at page 7, line 1, of Tigges et al refers to access to the shank of the rudder propeller being provided through a shank cover. Since the sentence also states that the main car deck can be arranged directly above the rotary bearing of the rudder propeller, appellant submits that this implies that the shank cover is provided in the main car deck. Appellant believes that the only other evidence of record that bears on whether it would have been obvious to provide a maintenance space below the cargo deck is Heer et al, U.S. Patent 6,790,109 (which, like Tigges et al, claims priority of PCT/DE99/01422, PCT/DE99/01842 and DE 19928961.1 and, therefore, appellant submits, relates to the same vessel as Tigges et al). In Heer et al, it is clear that maintenance access to the steering propellers is provided through the car deck 5 and that access from a space beneath the car deck is blocked by the structures shown above the box structure 11. Appellant submits that based on the present record, there is nothing to support the examiner's contention that it would have been an obvious matter of design choice to provide a maintenance space as set forth in claim 15.

F. The subject matter of claim 16 is not disclosed or suggested by Tigges et al and Oshima.

To the extent that the examiner's argument that the method steps of claim 16 are encompassed in the combination of Tigges et al and Oshima means that if Tigges et al and Oshima are not

properly combinable in the manner discussed in connection with claim 8, claim 16 is allowable, appellant agrees with the examiner. However, if the examiner contends that since Tigges et al and Oshima are combinable and therefore claim 8 is not allowable, it necessarily follows that claim 16 also is not allowable, appellant respectfully disagrees.

Claim 8 is directed to a water craft whereas claim 16 is directed to a method of operating a water craft. The method of claim 16 may be implemented in a water craft or vessel having a main propulsion means by providing steering propulsion devices at each side of the main propulsion device. In carrying out the method, the main propulsion means is used exclusively to propel the vessel and not to apply steering force to the vessel and the vessel is steered by applying propulsion forces to the craft (using the steering propulsion devices in the implementation mentioned) and selectively varying the directions of the steering forces.

Claim 16 specifies structural elements that are necessary in order to give proper context to the method steps. Some of these structural elements are disclosed in Tigges et al and are recited in claim 8. However, the fact that these structural elements are also mentioned in claim 8 does not mean that the rejection applied to claim 8 is also applicable to claim 16, because the operative steps set forth in claim 16 do not have counterparts in the structure recited in claim 8. For example, claim 16 recites the step of continuously using the main propulsion means exclusively to propel the water craft and not to apply steering force to the water craft.

G. The subject matter of claim 17 is not disclosed or suggested by the cited references.

Claim 17 is dependent on claim 16 and includes two limitations, namely that the steering propulsion forces that are

applied to the water craft are applied by first and second steering propulsion devices located in the aft region of the water craft to the first and second sides respectively of the propulsion means, and that the first and second steering propulsion devices are also used to propel the water craft in the forward direction. Thus, claim 17 invokes the three modes of operation discussed above. For navigating on a straight course, the main propulsion means is used to propel the watercraft (in accordance with claim 16) and the first and second steering propulsion devices are also used to propel the watercraft (in accordance with claim 17). For course adjustment, the first and second steering propulsion devices are used to apply steering propulsion forces to the watercraft (in accordance with claim 17) whereas the limitations of claim 16 require that the main propulsion means not be used to apply steering force to the craft. Similarly, for harbor maneuvering, in which the main propulsion means are not required, the steering propulsion devices are used both to propel the craft in the forward direction and to apply steering propulsion forces to the craft.

CONCLUSION

In view of the foregoing, appellant submits that claims 8, 15, 16, and 17 are patentable. It follows that the dependent claims 9-13 also are patentable. Appellant therefore requests

that the Board reverse the examiner's rejection and direct allowance of this application.

Respectfully submitted,

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CLAIMS APPENDIX

8. A water craft having an aft region and first and second opposite sides and comprising:

a hull,

a cargo deck at least in the aft region of the water craft and above which the hull defines a cargo space for accommodating trucks and other wheeled cargo,

a main propulsion means located in the aft region of the water craft for propelling the craft in a forward direction, and

at least first and second steering propulsion devices located in the aft region of the water craft to the first and second sides respectively of the main propulsion means, each steering propulsion device being selectively variable with respect to its propulsion direction, whereby steering of the water craft is continuously provided by the steering propulsion devices without a separate rudder means functionally connected to the main propulsion means,

wherein the steering propulsion devices are installed below the cargo deck,

and wherein the output required by the steering propulsion devices is in all less than 50% of the common shaft output of the main propulsion means and of the steering propulsion devices.

9. A water craft according to claim 8, wherein the water craft comprises an even number of steering propulsion devices each having a propeller part that is stationarily located outside the hull of the water craft.

10. A water craft according to claim 8, wherein the main propulsion means includes a propeller or a water-jet device.

11. A water craft according to claim 8, wherein the main propulsion means is located substantially centrally between the opposite sides of the water craft and the water craft comprises two steering propulsion devices located laterally of the main propulsion means to opposite respective sides of the main propulsion means.

12. A water craft according to claim 8, comprising a prime mover and a main propulsion shaft connecting the prime mover to the main propulsion means.

13. A water craft according to claim 12, wherein the prime mover is a diesel engine, an electric motor or a gas turbine.

15. A water craft according to claim 8, wherein a maintenance space is defined below the cargo deck and the steering propulsion devices are accessible in the maintenance space for maintenance purposes.

16. A method of operating a water craft having an aft region and first and second opposite sides, and comprising a hull, a cargo deck at least in the aft region of the water craft and above which the hull defines a cargo space for accommodating trucks and other wheeled cargo, and a main propulsion means located in the aft region of the water craft for propelling the craft in a forward direction, said method comprising continuously using the main propulsion means exclusively to propel the water craft and not to apply steering force to the water craft, and steering the water craft by applying steering propulsion forces to the water craft at first and second locations in the aft region to the first and second sides respectively of the main propulsion means and by selectively

varying the directions of the steering propulsion forces applied to the water craft at said first and second locations.

17. A method according to claim 16, comprising applying steering propulsion forces to the water craft using first and second steering propulsion devices located in the aft region of the water craft to the first and second sides respectively of the main propulsion means, and also using the first and second steering propulsion devices to propel the water craft in the forward direction.

EVIDENCE APPENDIX

Declaration of Karl Hamberg filed May 2, 2006 in submission under 37 CFR 1.114 entered in the record in Office Action mailed June 22, 2006.

Second declaration of Karl Hamberg filed January 30, 2007, appended to Applicant Arguments/Remarks Made in an Amendment, entered in the record in Office Action mailed April 17, 2007.

Statement of Karl Hamberg confirming truth of facts stated on pages 5-9 of reply to the Office Action mailed November 13, 2006, entered in the record in Office Action mailed April 17, 2007.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Jari SIRVIÖ et al

Art Unit: 3617

Application No: 10/500,056

Examiner:
Jesus D. Sotelo

Filed: June 23, 2004

For: ARRANGEMENT FOR STEERING A WATER-
CRAFT

DECLARATION OF KARL HAMBERG

COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

I, Karl Hamberg, declare as follows:

1. I was awarded the degree of Master of Science in Naval Architecture by Helsinki University of Technology in 1972.

2. Currently I am employed by Aker Arctic Technology Inc., which is a subsidiary company to Aker Finnyards Oy. Between 1973 and 2005 I was employed by Aker Finnyards Oy or its predecessors in Helsinki. For a period of 16 years, I acted as Head of the Project Design department, responsible for the Naval Architectural aspects of numerous projects and newbuildings. These include passenger cruise vessels, RoRo passenger ferries, naval vessels, icebreakers, cable layers, supply vessels, oceanographic research vessels, and container vessels.

3. By virtue of my education and experience, I am familiar with the level of skill of those engaged in the design and construction of water craft, and in particular with the design and construction of propulsion means and steering means for water craft, and I am an expert regarding the matters of opinion addressed in this declaration.

4. I am familiar with the contents of U.S. Patent Application No. 10/500,056 filed June 23, 2004 ("the '056 application"). I am also familiar with the disclosure of U.S. Patent 6,709,109 (Heer et al) and the English language abstract of Japanese Laid-Open Publication No. JP-914239A (Oshima), as cited by the examiner in prosecution of the '056 application.

5. The '056 application is assigned of record to Kvaerner Masa-Yards Oy, a predecessor of Aker Finnyards Oy, which in turn, is the parent company of my current employer. I have no interest in the outcome of the '056 application that is different from the interest of other employees of Aker Finnyards Oy or its subsidiaries.

6. Typically, RoRo vessels have frequent port calls and therefore good maneuverability is important. Steering propulsion devices are attractive for use with RoRo vessels, because they provide both good maneuverability and efficient propulsion. Accordingly, in a conventional RoRo vessel employing steering propulsion devices, the steering propulsion devices are designed to provide the propulsion power for the vessel.

7. It is known to provide a RoRo vessel with a wide stern ramp for transfer of cargo between the cargo space and port facilities. The available height for the installation of propulsion devices below the cargo space is dictated by port facilities, hydrodynamic requirements and ship stability. It is obvious that the size of a steering propulsion device is, inter alia, dependent on its power rating. In a conventional RoRo vessel employing steering propulsion devices that are sized to provide the propulsion power for the vessel, the upper parts of the steering propulsion devices extend up through the cargo deck, limiting the cargo space and preventing unobstructed movement of the cargo during loading and unloading.

8. An aim of the invention described in the '056 application is to provide more space and better utilization of the cargo

space in RoRo vessels. The invention is based at least in part on the recognition that the power of the steering propulsion devices necessary to achieve good maneuverability is typically well below the required power for propulsion.

9. The solution described and claimed in the '056 application is based on utilizing a main propulsion device to provide most of the power needed for propulsion of the vessel and at both sides thereof two smaller steering propulsion devices for steering and to provide the balance of the power needed for propulsion. The combined power output of the steering propulsion devices should be less than 50% of the total output of the propulsion arrangement.

Hereby the ship can be provided with efficient propulsion means as well as good manoeuverability due to the steering propulsion devices, which can remain relatively small and relatively lightweight and, thus, require less space than the steering propulsion devices of Heer et al. It is to be expected that this arrangement would be less expensive compared to a traditional one with two large steering propulsion devices, and still, it allows for more cargo and more efficient movement thereof during harbor operations.

10. The reference Oshima, JP 9142391 A, discloses a vessel which is intended for oceanic research and is provided with a propulsion configuration selected to achieve a reduction of underwater noise, which is known to be harmful for underwater acoustic equipment. Although this configuration resembles the one utilized in accordance with the invention as such, Oshima is entirely silent as regards any problems related to better utilization of cargo space at the aft part specifically regarding RoRo vessels. On the basis of the figures the ship does not have any cargo space at the aft part at least suitable for RoRo cargo. Oshima is silent also regarding the division of output power between the main propulsion means and the steering propulsion

devices.

11. The reference Heer et al, US 6,790,109 B1, discloses an electric steering propeller arrangement. The aim of Heer et al is to provide more space in the stern of the ship, specifically of the RoRo type, when electrical steering propellers are utilized. The solution is to use special arrangements at the upper part of the steering propellers enabling flatter mounting thereof, and thus, gain more space on the cargo deck. Thus, the goal of the arrangement shown by Heer et al is much the same as is the case with the present invention. The total propulsive power is in the case of Heer et al distributed to the steering propellers. So, in principle, the common aim of Heer et al and the present invention is to provide for more space for cargo in RoRo vessels and better utilization of the space available during harbor operations. In practice, however, the aims have been achieved in quite different ways resulting in alternative solutions respectively. Heer et al has chosen to modify the upper construction of the propulsion arrangement based on steering propellers only, whereas according to the invention quite another kind of propulsion arrangement has been selected based on distributing the power output between different types of propulsion means, which permits use of lower power, and hence smaller, steering propulsion devices. As a consequence, compared with Heer et al, the arrangement according to the invention has a potential for better redundancy, lower weight and costs, since the large steering propellers of Heer et al require heavy, large and expensive electric generator sets to provide the needed electric power for the steering propellers.

12. As regards combining the teachings of Heer et al and Oshima, due to excellent manoeuverability inherently provided by the steering propellers, there is no need to totally change the propulsion configuration of Heer et al, which has specifically and already been adapted for the space requirements as disclosed.

The hydro-acoustic noise problem referred by Oshima has no relevance in the ship types discussed by Heer et al.

13. Therefore in my opinion a person of ordinary skill in the art, presented with the disclosures of Heer et al and Oshima, would not have found it obvious to combine these disclosures in the manner suggested by the examiner and arrive at the invention as claimed in the '056 application. In my opinion, the only possible reason why a person of ordinary skill in the art would apply the propulsion and steering arrangements disclosed by Oshima to the ship of Heer et al would be if that person were reconstructing the invention claimed in the '056 application with benefit of hindsight.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Title 18, United States Code, Sec. 1001, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.


Name

April 28th, 2006
Date

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Jari SIRVIÖ et al

Art Unit: 3617

Application No: 10/500,056

Examiner:
Jesus D. Sotelo

Filed: June 23, 2004

For: ARRANGEMENT FOR STEERING A WATER-
CRAFT

DECLARATION OF KARL HAMBERG

COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

I, Karl Hamberg, declare as follows:

1. I was awarded the degree of Master of Science in Naval Architecture by Helsinki University of Technology in 1972.

2. Currently I am employed by Aker Arctic Technology Inc., which is a subsidiary company to Aker Finnyards Oy. Between 1973 and 2005 I was employed by Aker Finnyards Oy or its predecessors in Helsinki. For a period of 16 years, I acted as Head of the Project Design department, responsible for the Naval Architectural aspects of numerous projects and newbuildings. These include passenger cruise vessels, RoRo passenger ferries, naval vessels, icebreakers, cable layers, supply vessels, oceanographic research vessels, and container vessels.

3. By virtue of my education and experience, I am familiar with the level of skill of those engaged in the design and construction of water craft, and in particular with the design and construction of propulsion means and steering means for water craft, and I am an expert regarding the matters of opinion addressed in this declaration.

4. I am familiar with the contents of U.S. Patent Application No. 10/500,056 filed June 23, 2004 ("the '056

application"). I am also familiar with the disclosure of U.S. Patent 6,709,109 (Heer et al), Canadian Published Patent Application No. 2,373,462 (Tigges et al) and the English language abstract of Japanese Laid-Open Publication No. JP-914239A (Oshima), as cited by the examiner in prosecution of the '056 application.

5. The '056 application is assigned of record to Kvaerner Masa-Yards Oy, a predecessor of Aker Finnyards Oy, which in turn is the parent company of my current employer. I have no interest in the outcome of the '056 application that is different from the interest of other employees of Aker Finnyards Oy or its subsidiaries.

6. Typically, RoRo vessels have frequent port calls and therefore good maneuverability is important. Steering propulsion devices are attractive for use with RoRo vessels, because they provide both good maneuverability and efficient propulsion. Accordingly, in a conventional RoRo vessel employing steering propulsion devices, the steering propulsion devices are sized to provide the propulsion power for the vessel.

7. It is known to provide a RoRo vessel with a wide stern ramp for transfer of cargo between the cargo space and port facilities. The available height for the installation of propulsion devices below the cargo space is dictated by port facilities, hydrodynamic requirements and ship stability. It is obvious that the size of a steering propulsion device is, inter alia, dependent on its power rating. In a conventional RoRo vessel employing steering propulsion devices that are sized to provide the propulsion power for the vessel, the upper parts of the steering propulsion devices extend up through the cargo deck, limiting the cargo space and preventing unobstructed movement of the cargo during loading and unloading.

8. An aim of the invention described in the '056 application is to provide more space and better utilization of the cargo space in RoRo vessels. The invention is based at

least in part on the recognition that the power of the steering propulsion devices necessary to achieve good maneuverability is typically well below the required power for propulsion.

9. The solution described and claimed in the '056 application is based on utilizing a main propulsion device to provide most of the power needed for propulsion of the vessel and at both sides thereof two smaller steering propulsion devices for steering and to provide the balance of the power needed for propulsion. The combined power output of the steering propulsion devices should be less than 50% of the total output of the propulsion arrangement. Hereby the ship can be provided with efficient propulsion means as well as good maneuverability due to the steering propulsion devices, which can remain relatively small and relatively lightweight and, thus, require less space than the steering propulsion devices of Tigges et al and Heer et al. It is to be expected that this arrangement would be less expensive compared to a traditional one with two large steering propulsion devices, and still, it allows for more cargo and more efficient movement thereof during harbor operations.

10. The reference Oshima, JP 9142391 A, discloses a vessel which is intended for oceanic research and is provided with a propulsion configuration selected to achieve a reduction of underwater noise, which is known to be harmful for underwater acoustic equipment. Although this configuration resembles the one utilized in accordance with the invention as such, Oshima is entirely silent as regards any problems related to better utilization of cargo space at the aft part specifically regarding RoRo vessels. On the basis of the figures the ship does not have any cargo space at the aft part at least suitable for RoRo cargo. Oshima is silent also regarding the division of output power between the main propulsion means and the steering propulsion devices.

11. The reference Heer et al, US 6,790,109 B1, discloses an electric steering propeller arrangement. The aim of Heer et

al is to provide more space in the stern of the ship, specifically of the RoRo type, when electrical steering propellers are utilized. The solution is to use special arrangements at the upper part of the steering propellers enabling flatter mounting thereof, and thus, gain more space on the cargo deck. Thus, the goal of the arrangement shown by Heer et al is much the same as is the case with the present invention. The total propulsive power is in the case of Heer et al distributed to the steering propellers. So, in principle, the common aim of Heer et al and the present invention is to provide for more space for cargo in RoRo vessels and better utilization of the space available during harbor operations. In practice, however, the aims have been achieved in quite different ways resulting in alternative solutions respectively. Heer et al has chosen to modify the upper construction of the propulsion arrangement based on steering propellers only, whereas according to the invention quite another kind of propulsion arrangement has been selected based on distributing the power output between different types of propulsion means, which permits use of lower power, and hence smaller, steering propulsion devices. As a consequence, compared with Heer et al, the arrangement according to the invention has a potential for better redundancy, lower weight and costs, since the large steering propellers of Heer et al require heavy, large and expensive electric generator sets to provide the needed electric power for the steering propellers.

12. The reference Tigges et al, CA 2,373,462 A1, discloses an electric steering propeller arrangement that is, in my opinion, substantially similar to that of Heer et al. regarding features relevant to the '056 application. Thus, the details of FIG. 3 of Tigges et al regarding the steering propellers are substantially similar to those shown in FIG. 1 of Heer et al. FIG. 3 of Tigges et al shows that the steering propellers are of relatively low vertical height. However, the main focus of Tigges et al is on the hydrodynamic shape of the hull form forward of and around the thrusters. Therefore, one

may suspect that the geometry shown by Tiggers et al in this respect is "indicative only". This is contrary to Heer et al, which focuses on the geometrical aspects of the fitting of thrusters to the hull. As a conclusion, In my opinion so far as the invention disclosed and claimed in the '056 application is concerned, Tiggess et al adds nothing of substance to Heer et al.

13. As regards combining the teachings of Heer et al or Tiggess et al and Oshima, due to excellent maneuverability inherently provided by the steering propellers, there is no need to totally change the propulsion configuration of Heer et al or Tiggess et al, which has specifically and already been adapted for the space requirements as disclosed. The hydro-acoustic noise problem referred by Oshima has no relevance in the ship types discussed by Heer et al and Tiggess et al.

14. Therefore in my opinion a person of ordinary skill in the art, presented with the disclosures of Heer et al, Tiggess et al and Oshima, would not have found it obvious to combine these disclosures in the manner suggested by the examiner and arrive at the invention as claimed in the '056 application. In particular, in my opinion a person of ordinary skill in the art would not have found it obvious to apply the teaching of Oshima regarding a main propulsion arrangement and two steering propellers at opposite respective sides of the main propulsion arrangement to the vessel shown by either Tiggess et al or Heer et al. In my opinion, the only possible reason why a person of ordinary skill in the art would apply the propulsion and steering arrangements disclosed by Oshima to the ship of Tiggess et al or Heer et al would be to reconstruct the invention claimed in the '056 application with benefit of hindsight.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that

willful false statements and the like so made are punishable by fine or imprisonment, or both, under Title 18, United States Code, Sec. 1001, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

RL 76

Name

24, 1, 2007

Date

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Jari SIRVIÖ et al

Confirmation

No: 9131

Application No: 10/500,056

Art Unit: 3617

Filed: June 23, 2004

Examiner:

For: ARRANGEMENT FOR STEERING A WATER-
CRAFT

Jesus D. Sotelo

REPLY TO THE OFFICE ACTION MAILED 11/13/2006

COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

Sir:

Further examination and consideration of this application
are requested in view of the following Amendments and Remarks.

CLAIM AMENDMENTS

1-7 (Cancelled)

8. (Previously Presented) A water craft having an aft region and first and second opposite sides and comprising:

a hull,

a cargo deck at least in the aft region of the water craft and above which the hull defines a cargo space for accommodating trucks and other wheeled cargo,

a main propulsion means located in the aft region of the water craft for propelling the craft in a forward direction, and

at least first and second steering propulsion devices located in the aft region of the water craft to the first and second sides respectively of the main propulsion means, each steering propulsion device being selectively variable with respect to its propulsion direction, whereby steering of the water craft is continuously provided by the steering propulsion devices without a separate rudder means functionally connected to the main propulsion means,

wherein the steering propulsion devices are installed below the cargo deck,

and wherein the output required by the steering propulsion devices is in all less than 50% of the common shaft output of the main propulsion means and of the steering propulsion devices.

9. (Previously Presented) A water craft according to claim 8, wherein the water craft comprises an even number of steering propulsion devices each having a propeller part that is stationarily located outside the hull of the water craft.

10. (Previously Presented) A water craft according to claim 8, wherein the main propulsion means includes a propeller or a water-jet device.

11. (Previously Presented) A water craft according to claim 8, wherein the main propulsion means is located substantially

centrally between the opposite sides of the water craft and the water craft comprises two steering propulsion devices located laterally of the main propulsion means to opposite respective sides of the main propulsion means.

12. (Previously Presented) A water craft according to claim 8, comprising a prime mover and a main propulsion shaft connecting the prime mover to the main propulsion means.

13. (Previously Presented) A water craft according to claim 12, wherein the prime mover is a diesel engine, an electric motor or a gas turbine.

14. (Cancelled).

15. (Currently Amended) A water craft according to ~~claim 14,~~ wherein claim 8, wherein a maintenance space is defined below the cargo deck and the steering propulsion devices are accessible in the maintenance space for maintenance purposes.

16. (Previously Presented) A method of operating a water craft having an aft region and first and second opposite sides, and comprising a hull, a cargo deck at least in the aft region of the water craft and above which the hull defines a cargo space for accommodating trucks and other wheeled cargo, and a main propulsion means located in the aft region of the water craft for propelling the craft in a forward direction, said method comprising continuously using the main propulsion means exclusively to propel the water craft and not to apply steering force to the water craft, and steering the water craft by applying steering propulsion forces to the water craft at first and second locations in the aft region to the first and second sides respectively of the main propulsion means and by selectively varying the directions of the steering propulsion

forces applied to the water craft at said first and second locations.

17. (Previously Presented) A method according to claim 16, comprising applying steering propulsion forces to the water craft using first and second steering propulsion devices located in the aft region of the water craft to the first and second sides respectively of the main propulsion means, and also using the first and second steering propulsion devices to propel the water craft in the forward direction.

18. (Previously Presented) A water craft according to claim 8, wherein a maintenance space is defined below the cargo deck and the steering propulsion devices are accessible in the maintenance space for maintenance purposes.

REMARKS

Claim 15 stands rejected under 35 USC 112, second paragraph. Claim 15 has been amended and applicant believes that the rejection has been removed.

Claim 8 stands rejected under 35 USC 103 over Tigges et al in view of Oshima. Applicant notes for the record that both Tigges et al and Heer et al (previously relied on) are derived from PCT/DE00/00537. Thus, both Tigges et al and Heer et al are directed to application of the same underlying technology, namely a rudder propeller of lower vertical height than had previously been attained.

As previously explained, the present invention, as defined in claim 8, is concerned with a water craft comprising a cargo deck at least in the aft region of the water craft and above which the hull of the craft defines a cargo space for accommodating trucks and other wheeled vehicles. Thus, the invention is particularly applicable to RoRo and RoPax vessels, in which vehicles are driven on and off the vessel through doors in the stern of the vessel. This mode of operation implies a need for the cargo space at the aft end of the water craft to be clear of unnecessary obstructions. In accordance with the present invention, as defined in claim 8, the water craft comprises a main propulsion means located in the aft region of the water craft, and at least first and second steering propulsion devices installed below the cargo deck and located in the aft region of the water craft to first and second opposite sides respectively of the main propulsion means. The output required by the steering propulsion devices is less than 50% of the shaft output of the main propulsion means and the steering propulsion devices. Thus, the output of the steering propulsion devices is less than one third of the output of the main propulsion means.

The method claim 16 is similar to claim 8 in several respects but does not recite first and second steering propulsion devices. Instead, claim 16 recites the steps of applying

steering propulsion forces to the water craft at first and second locations in the aft region to the first and second sides respectively of the main propulsion means and selectively varying the directions of the steering propulsion forces applied to the water craft at the first and second locations. These steps effect steering of the water craft. Also, instead of specifying the relative power requirements of the steering propulsion devices and the main propulsion means, claim 16 recites an operating step that relates to the practical reason for the limitation in claim 8 regarding power requirements, namely that the main propulsion means is used for propulsion of the water craft, not for steering,

Tigges et al discloses a ship comprising two rudder propellers and a hull that defines a cargo space for accommodating wheeled vehicles. This is no different from the disclosure of Heer et al, which discloses a RoRo or RoPax ship (column 4, line 8) having two rudder propellers (FIG. 2).

Oshima discloses that a ship that uses underwater acoustic equipment, such as an oceanic research ship, may with advantage employ turning propellers 3 for steering and a separate main propeller 1 for propulsion because such an arrangement generates underwater noise at a reduced level. Oshima contains no disclosure regarding a cargo deck or a cargo space and there is nothing in Oshima that would lead a person of ordinary skill in the art to apply the teaching of Oshima to a water craft having a cargo space in an aft part of the hull.

The issue in this case is whether the examiner was correct in rejecting claims 8 and 16 under 35 USC 103 over Tigges et al in view of Oshima. Resolution of this issue turns on whether it would have been obvious to a person of ordinary skill in the art to employ a propulsion/steering mechanism similar to that shown by Oshima in the ship disclosed by Tigges et al. This question has already been discussed fully in connection with the rejection based on Oshima and Heer et al.

In support of the rejection the examiner argues that it would have been obvious to one having ordinary skill in the art to utilize, in the ship shown by Tigges et al, a main propulsion means located in the aft region of the water craft for propelling the water craft in a forward direction and first and second steering propulsion devices located in the aft region of the water craft to the first and second sides of the main propulsion means generally as taught by Oshima. Applicant submits that the examiner attributes too much to the disclosure of Oshima. Oshima does not contain a general teaching that a water craft should be provided with a main propulsion means located in the aft region of the water craft for propelling the water craft in a forward direction and first and second steering propulsion devices located in the aft region of the water craft to the first and second sides of the main propulsion means. On the contrary, Oshima is concerned with a very specific problem, namely excessive underwater noise in a vessel having a need for a quiet underwater environment, and the teaching of Oshima is directed to this problem. A person having ordinary skill in the art, wondering whether the disclosure of Oshima would be relevant to improving the ship of Tigges et al, must surely consider the problem that is solved by Oshima since that is the only indicator of the improvement that might be achieved by applying the disclosure of Oshima to the ship of Tigges et al. Should the problem that is solved by Oshima not exist in the ship of Tigges et al, there would be no clear reason why the person having ordinary skill in the art would apply the disclosure of Oshima to the ship of Tigges et al. Applicant submits that it would not have been obvious to a person having ordinary skill in the art to apply teaching that relates to the problem of reducing underwater noise to the ship of Tigges et al in which there is no requirement for a quiet underwater environment.

The examiner's position appears to be that because it would be technically feasible to apply the disclosure of Oshima regarding a main propulsion means and steering propulsion devices

to a water craft that has no need for a quiet underwater environment, it would have been obvious to do so. A rejection under 35 USC 103 requires more than a showing of technical feasibility. MPEP 2143 explains that to establish a *prima facie* case of obviousness based on multiple prior art references, the first of the three basic criteria that must be met is that "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art,...to combine the reference teachings." The arguments presented by the examiner are silent with respect to motivation or suggestion to combine the teachings of Tigges et al and Oshima.

Claim 16 requires that the main propulsion means be used exclusively to propel the water craft, i.e. that the main propulsion means is not used for steering. Oshima does not disclose or suggest that the main propulsion means of a water craft should not be used for steering the water craft. On the contrary, Oshima appears to be indifferent with respect to whether the main propulsion means is used for steering. FIGS. 4-6 show a craft in which the propeller 1 that is used to propel the craft is also used for steering, by means of a rudder 4, and FIGS. 7-8 show a craft in which the propeller 3 that is used to propel the craft is a steering propeller. Thus, regardless of whether the propeller 1 of the craft shown in FIGS. 1-3 is used for steering, the disclosure in Oshima, taken as a whole, would not suggest to a person of ordinary skill in the art that the main propulsion means of a water craft should be used exclusively to propel the craft.

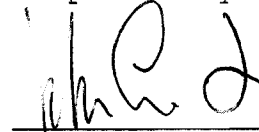
As noted above, so far as the examiner's rejection is concerned the disclosure of Tigges et al is substantially similar to that of Heer et al. Both Tigges et al and Heer et al claim benefit of PCT/DE99/01422, DE 199 28 961.1, PCT/DE99/01842 and PCT/DE00/00537. Thus, both Tigges et al and Heer et al are directed to application of the same underlying technology, namely a rudder propeller of lower vertical height than had previously

been attained. Although the main focus of the Tigges et al is on the underwater configuration of the hull and the main focus of Heer et al is on the structure of the rudder propeller, Tigges et al and Heer et al each refer to the rudder propeller being advantageous with respect to utilization of the cargo deck(s): see Heer et al, column 2, lines 28-38 and Tigges et al, page 6, lines 13-23. These features of Tigges et al and Heer et al are not relevant to the disclosure of Oshima. Therefore, a person having ordinary skill in the art would see no connection between Tigges et al (or Heer et al) and Oshima such as would suggest that a feature of Oshima should be applied to the ship of Tigges et al (or Heer et al).

In view of the foregoing, applicant submits that the disclosure of Oshima regarding a main propeller and two turn type propellers is not properly combinable, in the manner suggested by the examiner, with that of Tigges et al regarding a ship that is driven by two rudder propellers and has a cargo space for accommodating trucks and other wheeled vehicles. Accordingly, the invention as defined in claims 8 and 16 is not disclosed or suggested by Tigges et al and Oshima, whether taken singly or in combination. Therefore claims 8 and 16 are patentable and it follows that the dependent claims also are patentable.

A second declaration of Karl Hamberg is submitted herewith. Mr. Hamberg's second declaration supports the arguments presented above in support of patentability of claims 8 and 16.

Respectfully submitted,



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Docket: AWEK 2881

STATEMENT OF KARL HAMBERG

I have read the foregoing REPLY TO THE OFFICE ACTION MAILED 11/13/2006 and in my opinion as an expert regarding design and construction of water craft, the facts stated on pages 5-9 above are true.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Title 18, United States Code, Sec. 1001, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Karl H.
Name

24. 1. 2007
Date

RELATED PROCEEDINGS APPENDIX

None.